

(19)



Europäisches Patentamt  
European Patent Office  
Office européen des brevets



(11) Publication number:

**0 468 957 B1**

(12)

## EUROPEAN PATENT SPECIFICATION

(45) Date of publication of patent specification: **01.06.94** (51) Int. Cl.<sup>5</sup>: **F16K 7/16**

(21) Application number: **89905654.3**

(22) Date of filing: **24.04.89**

(86) International application number:  
**PCT/DK89/00095**

(87) International publication number:  
**WO 90/12972 (01.11.90 90/25)**

(54) **A SAMPLING VALVE.**

(43) Date of publication of application:  
**05.02.92 Bulletin 92/06**

(45) Publication of the grant of the patent:  
**01.06.94 Bulletin 94/22**

(84) Designated Contracting States:  
**AT BE CH DE FR GB IT LI LU NL SE**

(56) References cited:  
**CH-A- 635 407**  
**DK-B- 147 119**  
**SE-B- 318 753**  
**SE-B- 445 852**  
**US-A- 4 552 336**

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## Description

This invention relates to a sampling valve comprising a valve body having an axial bore, a valve stem axially displaceable in the bore, and a stretchable hollow valve plug that is mounted on the valve stem, the valve stem being axially displaceable within the valve plug, the front end of the valve stem pushing the valve plug in its stretched position wherein the latter closes against a valve seat coaxial with the bore and extending from an annular channel communicating with a pair of hose connection branches of the valve body.

Such a valve structure is disclosed in the published documents of Applicant's Danish Patent Application No. 2732/86. An important feature of this valve is that the valve plug is firmly bonded to the wall of the axial bore at least in its area adjacent the annular channel, for the purpose of preventing liquid from penetrating between the valve body and the plug. Such a risk is involved with a previously known sampling valve, cf. Danish Patent Specification No. 147,119, in which the plug is firmly bonded to the forward end portion of the stem and forms a plunger operating in the forward end of the bore.

In the latter case the plug may be withdrawn from the bore together with the valve stem, e.g. for renewal or for allowing the interior of the valve to be inspected, whereas in the former case such a withdrawal or removal of the plug from the bore is more complicated because its bonding to the bore wall must be broken. The plug may be thereby further damaged so that it cannot be used again.

Swiss patent specification No. 635 407 discloses a valve comprising a stretchable hollow valve plug, the front end of a valve stem pushing the valve plug in its stretched position whereby a collar at the open end of the valve plug is forced against an abutting sealing surface and the valve plug closes against a valve seat coaxial with the valve stem.

The sampling valve of the invention differs from the known structures by the feature that the valve plug rests with a collar at its open end against an abutting surface in the bore and in that on the inner surface of the valve plug member a bead is provided which in the mounted position of the member projects into a circumferential groove formed in the valve stem and having an axial length that is sufficient to permit the stretching of the valve plug from its open to its closed position.

Under normal operating conditions the groove of the valve stem does not prevent the bead from moving axially backwards and forwards relative to the stem when the plug is stretched and allowed to retract, respectively. However, when it is desired to remove the plug for inspection or other purposes,

the stem may simply be withdrawn axially out of the bore, thereby causing the plug to be carried along after the bead has come into contact with the forward side wall of the groove. When the plug has got clear of the bore, it may easily be snapped free from the stem, if so desired.

The invention will now be more fully described with reference to the drawing, in which

Fig. 1 is a side elevation and axial section of a preferred embodiment of the valve in its closed position, and

Fig. 2 a similar view of the valve when open.

In the illustrated embodiment the valve comprises a body or casing 1 adapted to be firmly mounted in the wall 2 of a tank or pipe containing a liquid from which samples shall be taken from time to time. A pair of hose connection branches 3 communicate at their inner ends with an annular channel 4 adjacent a central valve seat 5.

A bore 6 in body 1 is co-axial with the valve seat, and in this bore a valve stem is axially displaceable. The stem comprises a front or lower portion 7 and a back or upper portion 8 with a threaded connection 9 therebetween.

A stretchable hollow valve plug 10 fits into the forward end of the bore 6 and rests with a collar 11 at its open end against a shoulder in the bore. The plug 10 surrounds the forward end of the stem portion 7 which in Fig. 1 is urged to the left by a helical compression spring 12 so that the plug 10 is stretched longitudinally and with its forward end or bottom is held in close contact against the valve seat 5. In this position a small amount of liquid may be withdrawn from the tank or pipe by means of a hypodermic needle inserted through one of the branches and forced through the closed end of the plug 10.

The upper portion 8 of the stem is associated with a manual control, not shown, which is detachably connected with the valve body by means of a union nut 13 and is operative to displace the stem 7, 8 backwards against the force of the spring 12, so that the plug 10 is allowed to contract to the open position illustrated in Fig. 2.

On the inner side of the plug 10 an annular bead 14 is provided which projects into a circumferential groove 15 in stem portion 7. The axial length of this groove is such that it offers sufficient clearance for the bead when the plug is stretched and allowed to contract as explained above.

When it is desired to inspect the interior of the valve or possibly exchange plug 10, nut 13 may be loosened and stem 7, 8 retracted from the bore 6 whereby the plug 10 is carried along due to the contact between bead 14 and the forward side wall of groove 15.

## Claims

1. A sampling valve comprising a valve body (1) having an axial bore (6), a valve stem (7,8) axially displaceable in the bore, and a stretchable hollow valve plug (10) that is mounted on the valve stem, the valve stem (7,8) being axially displaceable within the valve plug (10), the front end of the valve stem (7,8) pushing the valve plug (10) in its stretched position wherein the latter closes against a valve seat (5) coaxial with the bore and extending from an annular channel (4) communicating with a pair of hose connection branches (3) of the valve body, characterized in that the valve plug (10) rests with a collar (11) at its open end against an abutting surface in the bore (6) and in that on the inner surface of the valve plug member (10) a bead (14) is provided which in the mounted position of the member projects into a circumferential groove (15) formed in the valve stem (7) and having an axial length that is sufficient to permit the stretching of the valve plug from its open to its closed position.

## Patentansprüche

1. Musterventil umfassend einen Ventilkörper (1) mit einer Axialbohrung (6), einen in der Bohrung axial verschiebbaren Ventilschaft (7, 8) und einen auf dem Ventilschaft montierten dehnbaren, hohlen Ventilzapfen (10), wobei der Ventilschaft (7, 8) innerhalb des Ventilzapfens (10) axial verschiebbar ist und das vordere Ende des Ventilschafts (7, 8) den Ventilzapfen (10) in seine gestreckte Position schiebt, wobei letzterer gegen einen koaxial mit der Bohrung und von einem ringförmigen Kanal (4), der mit einem Paar von Schlauchanschluss-Verzweigungen (3) des Ventilkörpers verbunden ist, ausgehenden Ventilsitz (5) schliesst, dadurch **gekennzeichnet**, dass der Ventilzapfen (10) mit einem Kragen (11) an seinem offenen Ende gegen eine Anlagefläche in der Bohrung (6) ruht, und dass auf der Innenfläche des Ventilzapfengliedes (10) eine Wulst (14) vorgesehen ist, die in der montierten Stellung des Zapfengliedes in eine im Ventilschaft (7) ausgebildete, rundgehende Rille (15) eingreift, welche Rille eine axiale Länge aufweist, die zum Strecken des Ventilzapfens von dessen offener zu dessen geschlossener Stellung ausreichend ist.

## Revendications

1. Soupape d'échantillonnage comportant un corps de soupape (1) à passage axial (6), une

tige de soupape (7,8) axialement déplaçable dans ce passage, et un bouchon étirable, creux, de soupape (10) qui est monté sur la tige de soupape, la tige de soupape (7,8) étant axialement déplaçable à l'intérieur du bouchon de soupape (10), l'extrémité frontale de la tige de soupape repoussant le bouchon de soupape (10) dans sa position étirée, dans laquelle il vient fermer un siège de soupape (5) qui est coaxial au passage et qui s'étend depuis un canal annulaire (4) en communication avec une paire d'ajutages (3) de branchement de tuyaux sur le corps de soupape, caractérisée en ce que le bouchon de soupape (10), à l'aide d'un collet (11) à son extrémité ouverte, prend appui contre un épaulement dans le passage axial et en ce que sur la face intérieure du bouchon de soupape (10) il est prévu un bourrelet (14) qui, en position montée du bouchon, fait saillie dans une gorge circumférentielle (15) formée dans la tige de soupape (7) et présentant une longueur axiale suffisante pour permettre au bouchon de soupape de s'étirer de sa position ouverte à sa position de fermeture.

